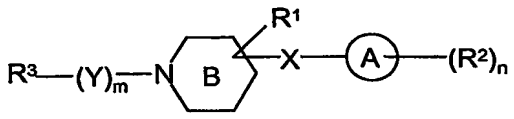
Claims

What is claimed is:

1. A compound of formula (I)



(I)

or a pharmaceutically acceptable derivative thereof, wherein:

X is a C_{1-5} alkylene chain, wherein said X is optionally substituted by one or more =O, =S, $-S(O)_t-$, alkyl, or halogen and wherein said C_{1-5} alkylene chain may optionally have 0-3 heteroatoms selected from oxygen, phosphorus, sulfur, or nitrogen;

Ring A is a saturated, partially saturated or aromatic 3-7 monocyclic or 8-10 membered bicyclic ring having one ring nitrogen and 0-4 additional heteroatoms selected from oxygen, phosphorus, sulfur, or nitrogen;

Ring B has an oxygen atom in addition to the depicted nitrogen;

R^1 is alkyl optionally substituted by one or more R^7, alkenyl optionally substituted by one or more R^7, alkynyl optionally substituted by one or more R^7, cycloalkyl optionally substituted by one or more R^8, heterocyclyl optionally substituted by one or more R^8, heteroaryl optionally substituted by one or more R^6, or aryl optionally substituted by one or more R^6; or R^1 and X taken together form a saturated, partially saturated or aromatic 5-6 memebered ring having 0-3 heteroatoms selected from oxygen, phosphorus, sulfur, or nitrogen that is fused to Ring A;

each R^2 is independently selected from the group consisting of-OR^0, $-C(O)-R^0$, $-S(O)_2-R^0$, $-C(O)-N(R^0)_2$, $-S(O)_2-N(R^0)_2$, $-(CH_2)_a-N(R^0)(-V_b-R^+)$, $-(CH_2)_a-(-V_b-R^+)$, halogen, alkyl optionally substituted by one or more R^7, alkenyl optionally substituted by one or more R^7, alkynyl optionally substituted by one or more R^7, aryl optionally substituted by one or more R^6, heteroaryl optionally substituted by one or more R^6, cycloalkyl optionally substituted by one or more R^8, and heterocyclyl optionally substituted by one or more R^8; and two adjacent R^2s on Ring A are optionally taken together to form a fused, saturated, partially saturated or aromatic 5-6 membered ring having 0-3 heteroatoms selected from oxygen,

phosphorus, sulfur, or nitrogen; or two geminal R^2s are optionally taken together to form a spiro, saturated, partially saturated or aromatic 5-6 membered ring having 0-3 heteroatoms selected from oxygen, phosphorus, sulfur, or nitrogen, said fused or spiro ring being optionally substituted by one or more R^8;

each a independently is 0-3;

each b independently is 0 or 1;

V is -C(O)-, -C(O)O-, $-S(O)_2-$, or $-C(O)-N(R^0)-$;

R^+ is alkyl, cycloalkyl, aralkyl, aryl, heteroaryl, heteroaralkyl, or heterocyclyl, wherein said R^+ is optionally substituted by one or more R^8;

m is 0 or 1;

n is 0-5;

R^3 is H, $-N(R^0)_2$, $-N(R^0)C(O)R^0$, -CN, halogen, CF_3, alkyl optionally substituted by one or more groups selected from R^7 or -S-aryl optionally substituted by $-(CH_2)_{1-6}-N(R^0)SO_2(R^0)$, alkenyl optionally substituted by one or more groups selected from R^7 or -S-aryl optionally substituted by $-(CH_2)_{1-6}-N(R^0)SO_2(R^0)$, alkynyl optionally substituted by one or more groups selected from R^7 or -S-aryl optionally substituted by $-(CH_2)_{1-6}-N(R^0)SO_2(R^0)$, cycloalkyl or carbocyclyl optionally substituted by one or more R^8, aryl optionally substituted by one or more R^6, heteroaryl optionally substituted by one or more R^6, or heterocyclyl optionally substituted by one or more R^8;

Y is alkyl, alkenyl, alkynyl, $-(CR^4R^5)_p-$, -C(O)-, -C(O)C(O)-, -C(S)-, $-O-(CH_2)_{0-4}-C(O)-$, $-(CH_2)_{0-4}-C(O)-O-$, $-N(R^0)-C(O)-$, $-C(O)-N(R^0)-$, $-N(R^0)-C(S)-$, $-S(O)_t-$, $-O-C(=N-CN)-$, $-O-C(=N-R^0)-$, $-C(=N-CN)-O-$, $-C(=N-R^0)-O-$, $-C(=N-CN)-S-$, $-S-C(=N-CN)-$, $-N(R^0)-C(=N-CN)-$, $-C(=N-CN)-$, $-N(R^0)-C[=N-C(O)-R^0]$, $-N(R^0)-C[=N-S(O)_t-R^0]$, $-N(R^0)-C(=N-OR^0)-$, $-N(R^0)-C(=N-R^0)-$, or $-C(=N-R^0)-$;

each R^4 is independently H, alkyl optionally substituted by R^7, alkenyl optionally substituted by R^7, or alkynyl optionally substituted by R^7;

each R^5 is independently selected from H, $-C(O)-OR^6$, $-C(O)-N(R^0)_2$, $-S(O)_2-N(R^0)_2$, $-S(O)_2-R^0$, aryl optionally substituted by R^6, or heteroaryl optionally substituted by R^6;

p is 1-5;

each t independently is 1 or 2;

each R^6 is independently selected from the group consisting of halogen, $-CF_3$, $-OCF_3$, $-OR^0$, $-(CH_2)_{1-6}-OR^0$, $-SR^0$, $-(CH_2)_{1-6}-SR^0$, $-SCF_3$, $-R^0$, methylenedioxy,

ethylenedioxy, $-NO_2$, -CN, $-(CH_2)_{1-6}$-CN, $-N(R^0)_2$, $-(CH_2)_{1-6}$-$N(R^0)_2$, $-NR^0C(O)R^0$, $-NR^0(CN)$, $-NR^0C(O)N(R^0)_2$, $-NR^0C(S)N(R^0)_2$, $-NR^0CO_2R^0$, $-NR^0NR^0C(O)R^0$, $-NR^0NR^0C(O)N(R^0)_2$, $-NR^0NR^0CO_2R^0$, $-C(O)C(O)R^0$, $-C(O)CH_2C(O)R^0$, $-(CH_2)_{0-6}CO_2R^0$, $-O-C(O)R^0$, $-C(O)R^0$, $-C(O)N(R^0)N(R^0)_2$, $-C(O)N(R^0)_2$, $-C(O)N(R^0)OH$, $-C(O)N(R^0)SO_2R^0$, $-OC(O)N(R^0)_2$, $-S(O)_tR^0$, $-S(O)_t-OR^0$, $-S(O)_tN(R^0)C(O)R^0$, $-S(O)_tN(R^0)OR^0$, $-NR^0SO_2N(R^0)_2$, $-NR^0SO_2R^0$, $-C(=S)N(R^0)_2$, $-C(=NH)-N(R^0)_2$, $-(CH_2)_{1-6}$-$C(O)R^0$, $-C(=N-OR^0)-N(R^0)_2$, $-O-(CH_2)_{0-6}-SO_2N(R^0)_2$, $-(CH_2)_{1-6}NHC(O)R^0$, and $-SO_2N(R^0)_2$ wherein the two R^0s on the same nitrogen are optionally taken together to form a 5-8 membered saturated, partially saturated, or aromatic ring having additional 0-4 heteroatoms selected from oxygen, phosphorus, nitrogen, or sulfur;

each R^7 is independently selected from the group consisting of halogen, $-CF_3$, $-R^0$, $-OR^0$, $-OCF_3$, $-(CH_2)_{1-6}-OR^0$, $-SR^0$, $-SCF_3$, $-(CH_2)_{1-6}-SR^0$, aryl optionally substituted by R^6, methylenedioxy, ethylenedioxy, $-NO_2$, -CN, $-(CH_2)_{1-6}$-CN, $-N(R^0)_2$, $-(CH_2)_{1-6}-N(R^0)_2$, $-NR^0C(O)R^0$, $-NR^0$ (CN), $-NR^0C(O)N(R^0)_2$, $-N(R^0)C(S)N(R^0)_2$, $-NR^0CO_2R^0$, $-NR^0NR^0C(O)R^0$, $-NR^0NR^0C(O)N(R^0)_2$, $-NR^0NR^0CO_2R^0$, $-C(O)C(O)R^0$, $-C(O)CH_2C(O)R^0$, $-(CH_2)_{0-6}-CO_2R^0$, $-C(O)R^0$, $-C(O)N(R^0)N(R^0)_2$, $-C(O)N(R^0)_2$, $-C(O)N(R^0)OH$, $-OC(O)R^0$, $-C(O)N(R^0)SO_2R^0$, $-OC(O)N(R^0)_2$, $-S(O)_tR^0$, $-S(O)_t-OR^0$, $-S(O)_tN(R^0)C(O)R^0$, $-S(O)_tN(R^0)OR^0$, $-NR^0SO_2N(R^0)_2$, $-NR^0SO_2R^0$, $-C(=S)N(R^0)_2$, $-C(=NH)-N(R^0)_2$, $-(CH_2)_{1-6}-C(O)R^0$, $-C(=N-OR^0)-N(R^0)_2$, $-O-(CH_2)_{0-6}-SO_2N(R^0)_2$, $-(CH_2)_{1-6}-NHC(O)R^0$, and $-SO_2N(R^0)_2$ wherein the two R^0s on the same nitrogen are optionally taken together to form a 5-8 membered saturated, partially saturated, or aromatic ring having additional 0-4 heteroatoms selected from oxygen, phosphorus, nitrogen, or sulfur;

each R^8 is independently selected from R^7, =O, =S, $=N(R^0)$, and =N(CN);

each R^0 is independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, carbocyclylalkyl, aryl, heteroaryl, aralkyl, heteroaralkyl, heterocyclyl, or heterocyclylalkyl, wherein each member of R^0 except H is optionally substituted by one or more R*, OR^*, $N(R^*)_2$, =O, =S, halo, CF_3, NO_2, CN, $-C(O)R^*$, $-CO_2R^*$, -C(O)-aryl, -C(O)-heteroaryl, -C(O)-aralkyl, $-S(O)_t$-aryl, $-S(O)_t$-heteroaryl, $-NR^*SO_2R^*$, $-NR^*C(O)R^*$, $-NR^*C(O)N(R^*)_2$, $-N(R^*)C(S)N(R^*)_2$, $-NR^*CO_2R^*$, $-NR^*NR^*C(O)R^*$, $-NR^*NR^*C(O)N(R^*)_2$, $-NR^*NR^*CO_2R^*$, $-C(O)C(O)R^*$, $-C(O)CH_2C(O)R^*$, $-C(O)N(R^*)N(R^*)_2$, $-C(O)N(R^*)_2$, $-C(O)NR^*SO_2R^*$, $-OC(O)N(R^*)_2$, $-S(O)_tR^*$, $-NR^*SO_2N(R^*)_2$, and $-SO_2N(R^*)_2$ wherein the two R*s on the same nitrogen are optionally taken together to form a 5-8 membered saturated, partially saturated or

aromatic ring having additional 0-4 heteroatoms selected from oxygen, phosphorus, nitrogen or sulfur; and

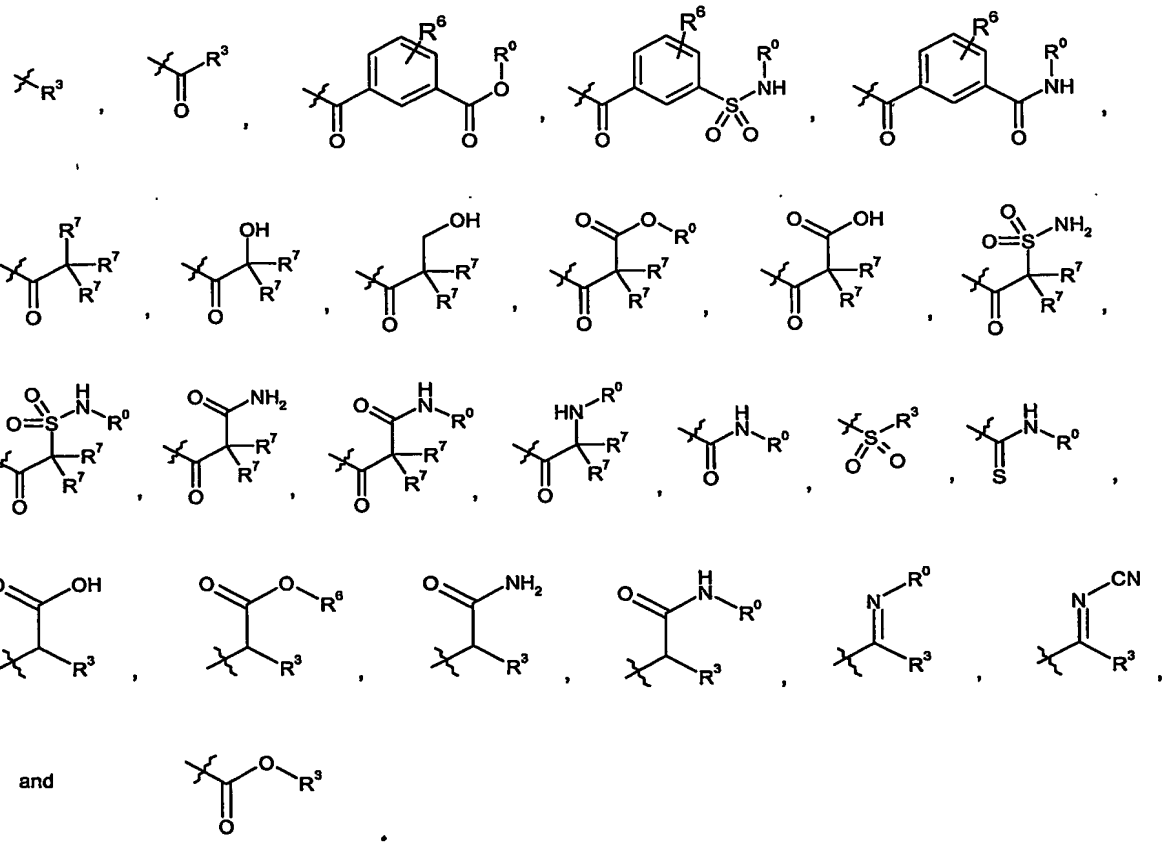
each R* is independently H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, or heteroaryl.

2. The compound of claim 1 wherein R^1 is optionally substitued aryl.

3. The compound of claim 2 wherein R^1 is phenyl mono- or di- substituted with halogen.

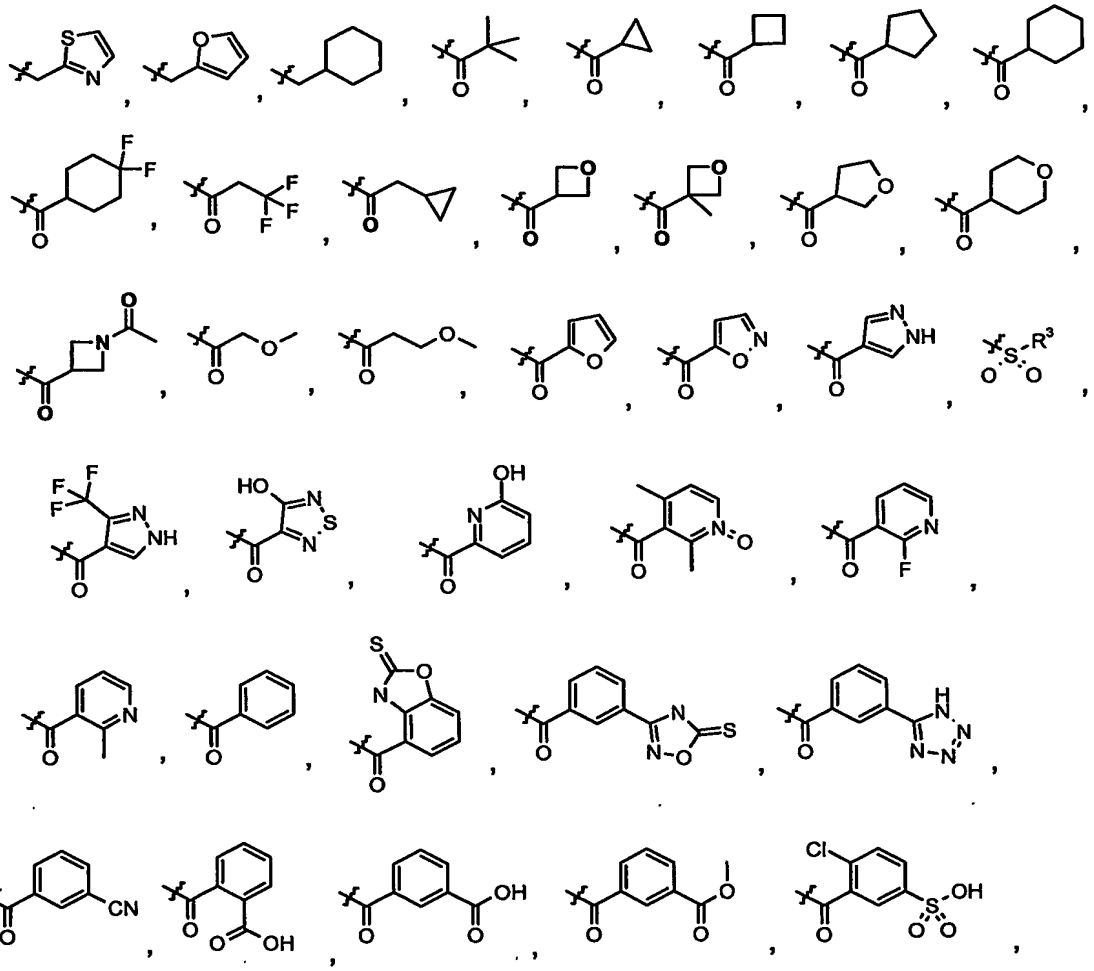
4. The compound of claim 3 wherein R^1 is phenyl di-substituted with Cl.

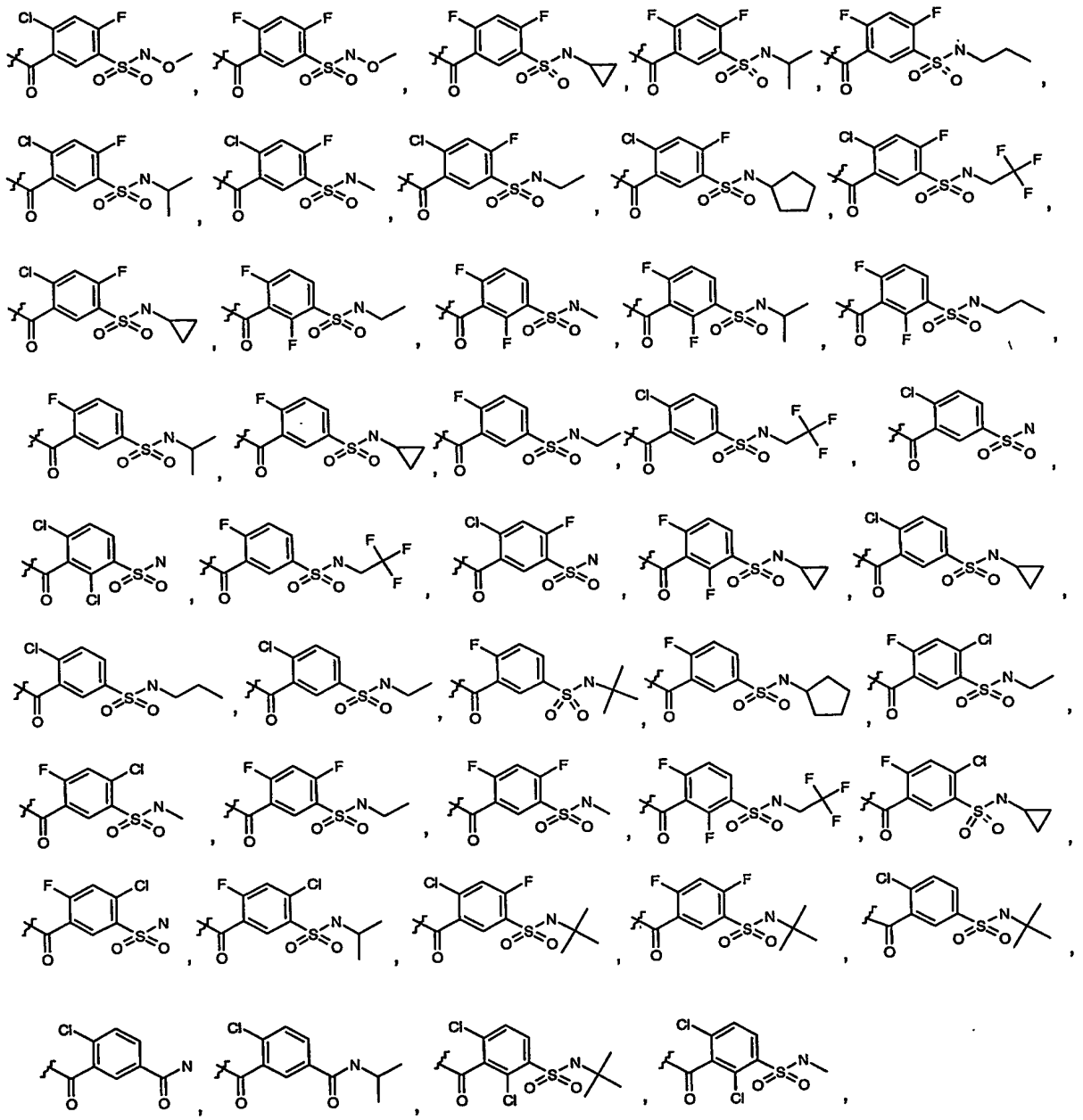
5. The compound of claim 1 wherein $-(Y)_m-R^3$ is

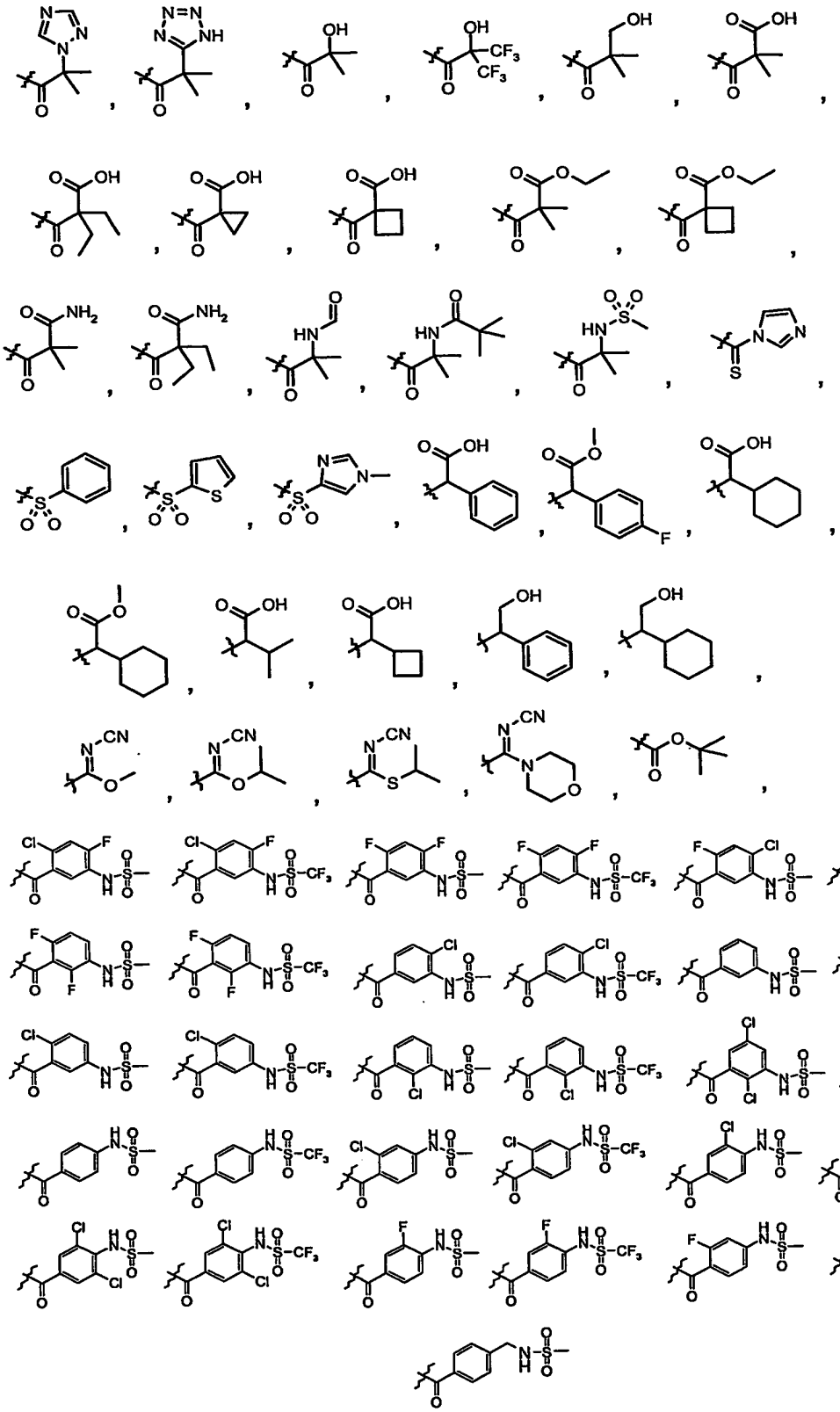


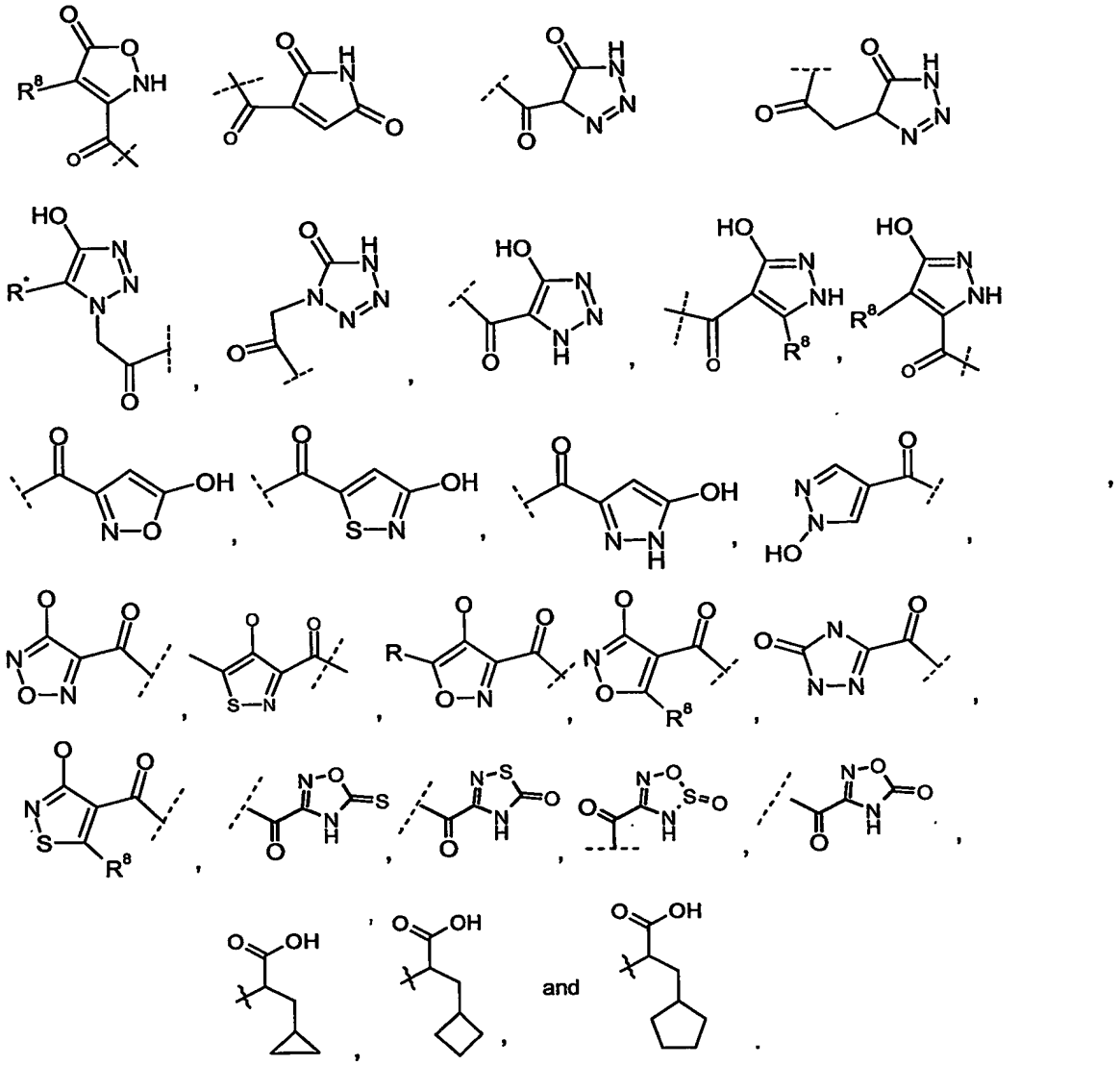
and

6. The compound of claim 1 wherein $-(Y)_m-R^3$ is









7. The compound of claim 1 wherein m is 1, Y is –C(O)-, and R^3 is either aryl or heteroaryl wherein either is optionally substituted, optionally substituted alkyl, or optionally substituted cycloalkyl.

8. The compound of claim 1 wherein m is 1, Y is –(C=N-CN)-O-, and R^3 is optionally substituted aryl, optionally substituted alkyl, optionally substituted cycloalkyl, optionally substituted heteroaryl, or optionally substituted heterocyclyl.

9. The compound of claim 1 wherein m is 1, Y is $-(CH_2)-$, and R^3 is optionally substituted aryl.

10. The compound of claim 1 wherein m is 1, Y is $-C(O)O-$, and R^3 is optionally substituted alkyl or optionally substituted aryl.

11. The compound of claim 1 wherein m is 0 and R^3 is optionally substituted heteroaryl or optionally substituted heterocyclyl.

12. The compound of claim 1 where X is $-(CH_2)-$, $-(CH_2-CH_2)-$, or $-(CH_2-CH_2-CH_2)-$.

13. The compound of claim 12 wherein X is optionally substituted by one or more halogen or oxo.

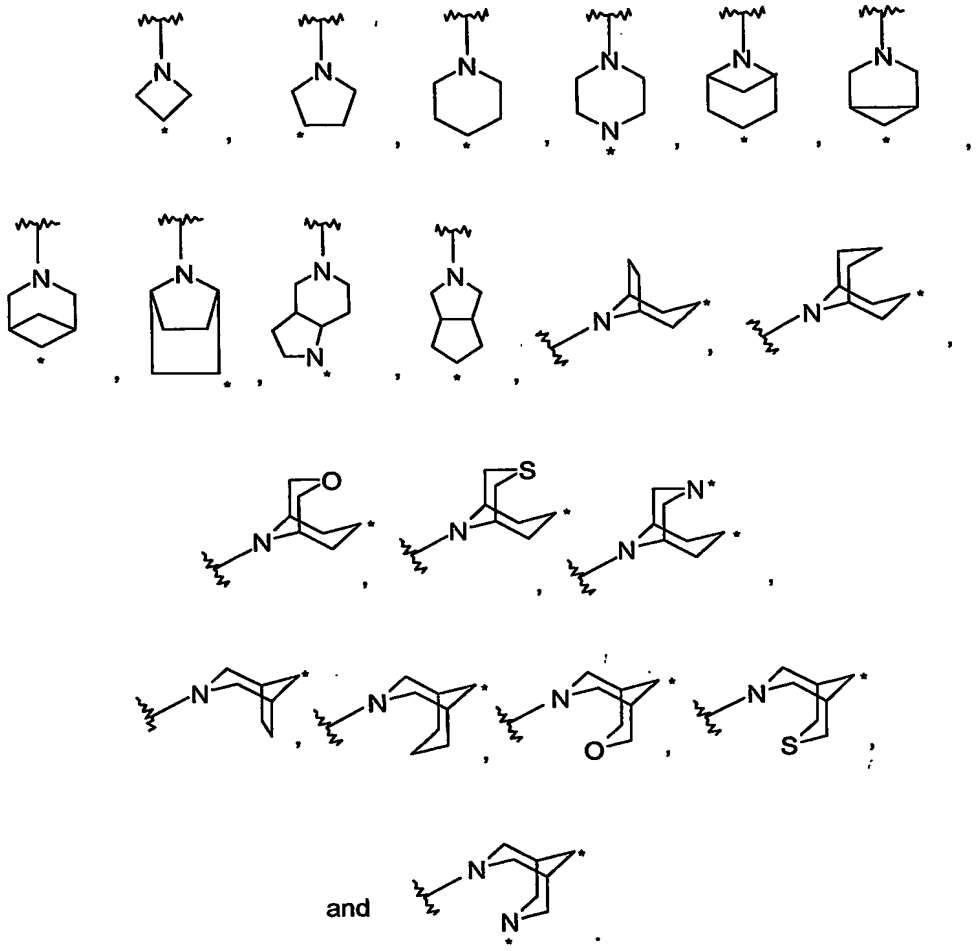
14. The compound of claim 13 wherein X is disubstituted with halogen.

15. The compound of claim 14 wherein X is disubstituted with fluoro.

16. The compound of claim 15 wherein X is $-(CF_2-CH_2)-$.

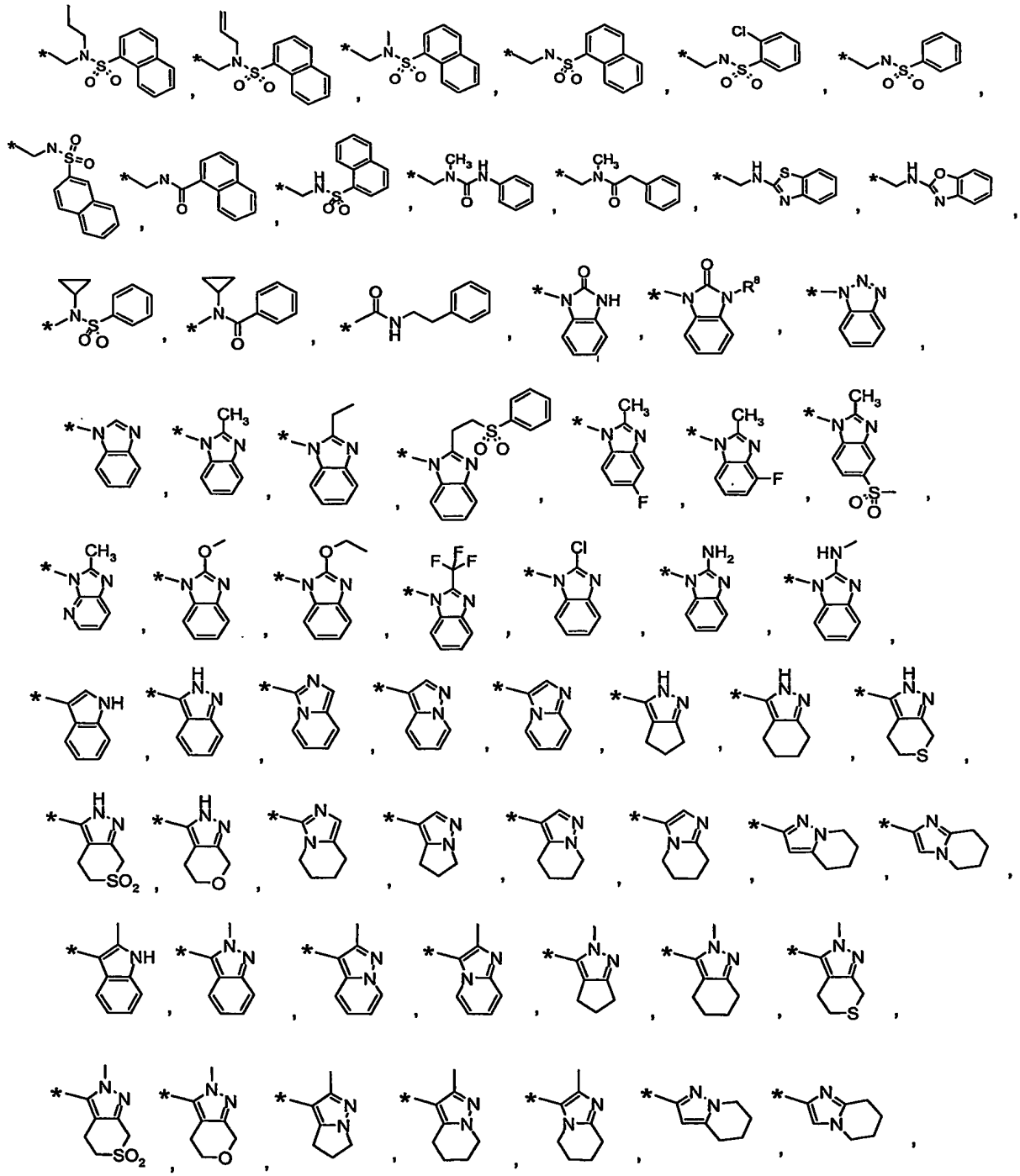
17. The compound of claim 13 wherein X optionally has 1-3 heteroatoms selected from oxygen, phosphorus, sulfur, or nitrogen.

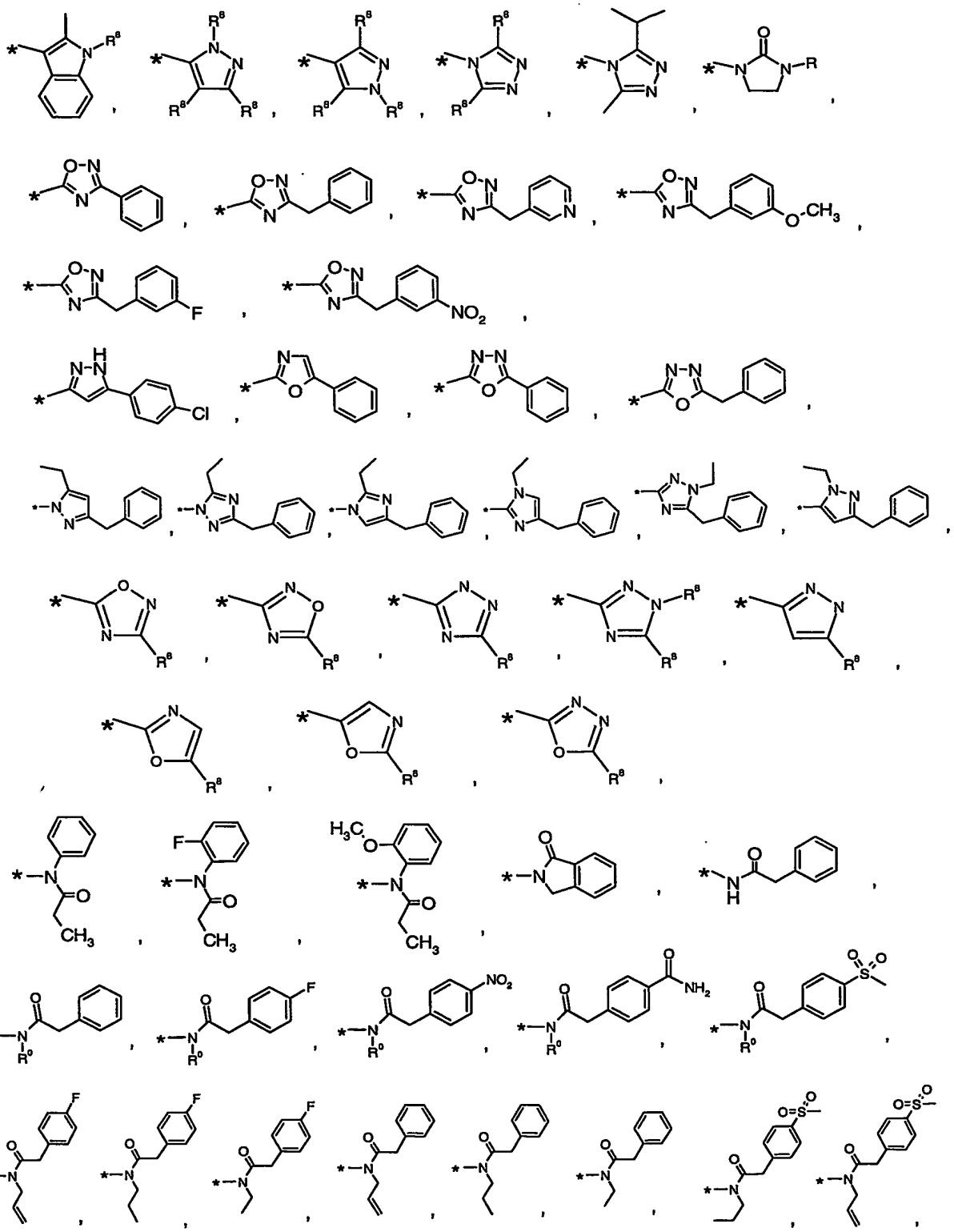
18. The compound of claim 1 wherein the A ring is selected from the following, where the asterisk (*) indicates the preferred, but not limiting, point(s) of substitution:

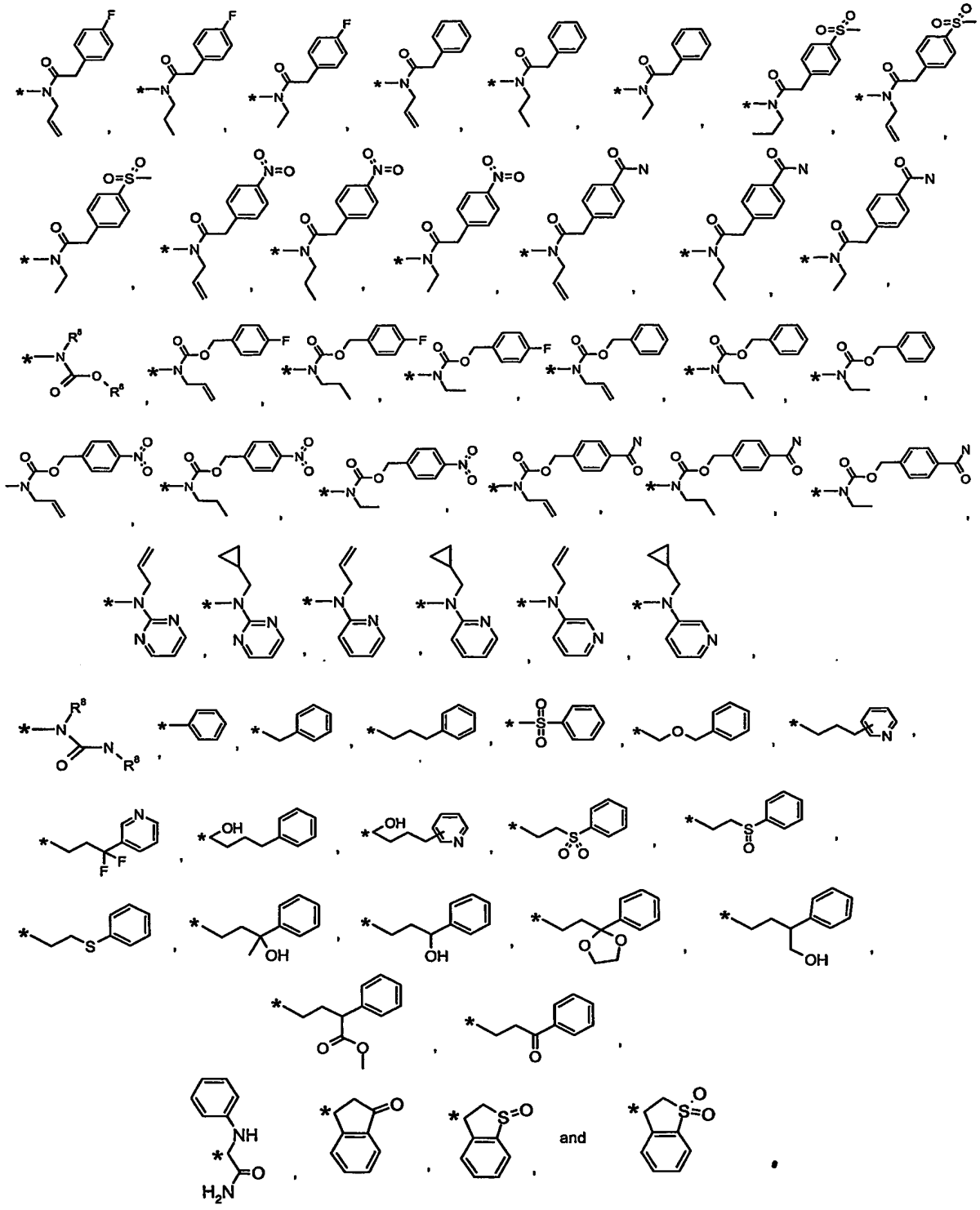


and

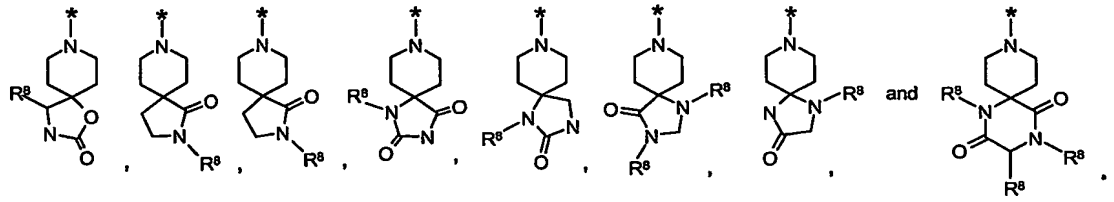
19. The compound of claim 18 wherein each R^2, with an asterisk indicating a point of substitution from ring A, independently is selected from:





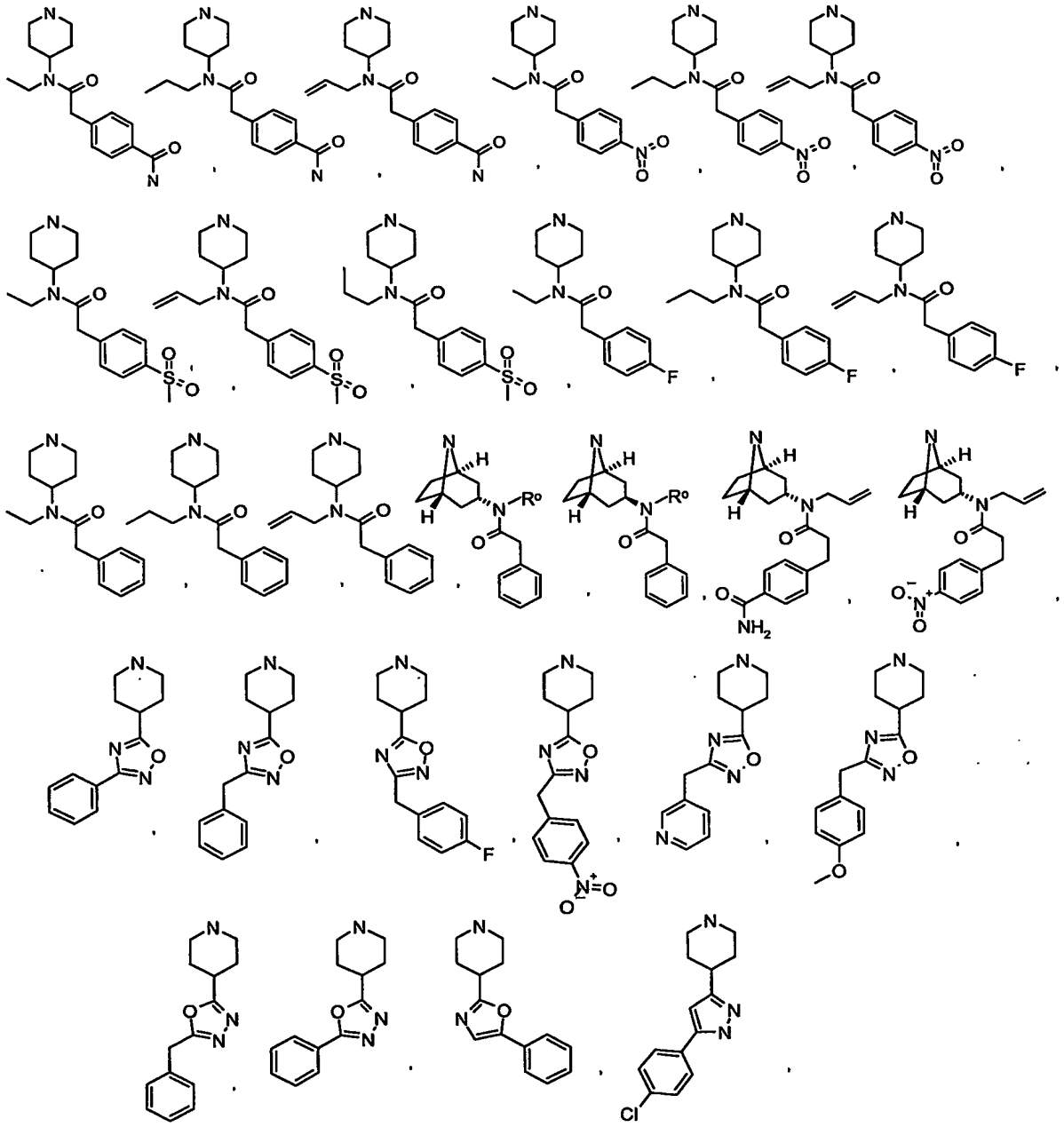

and

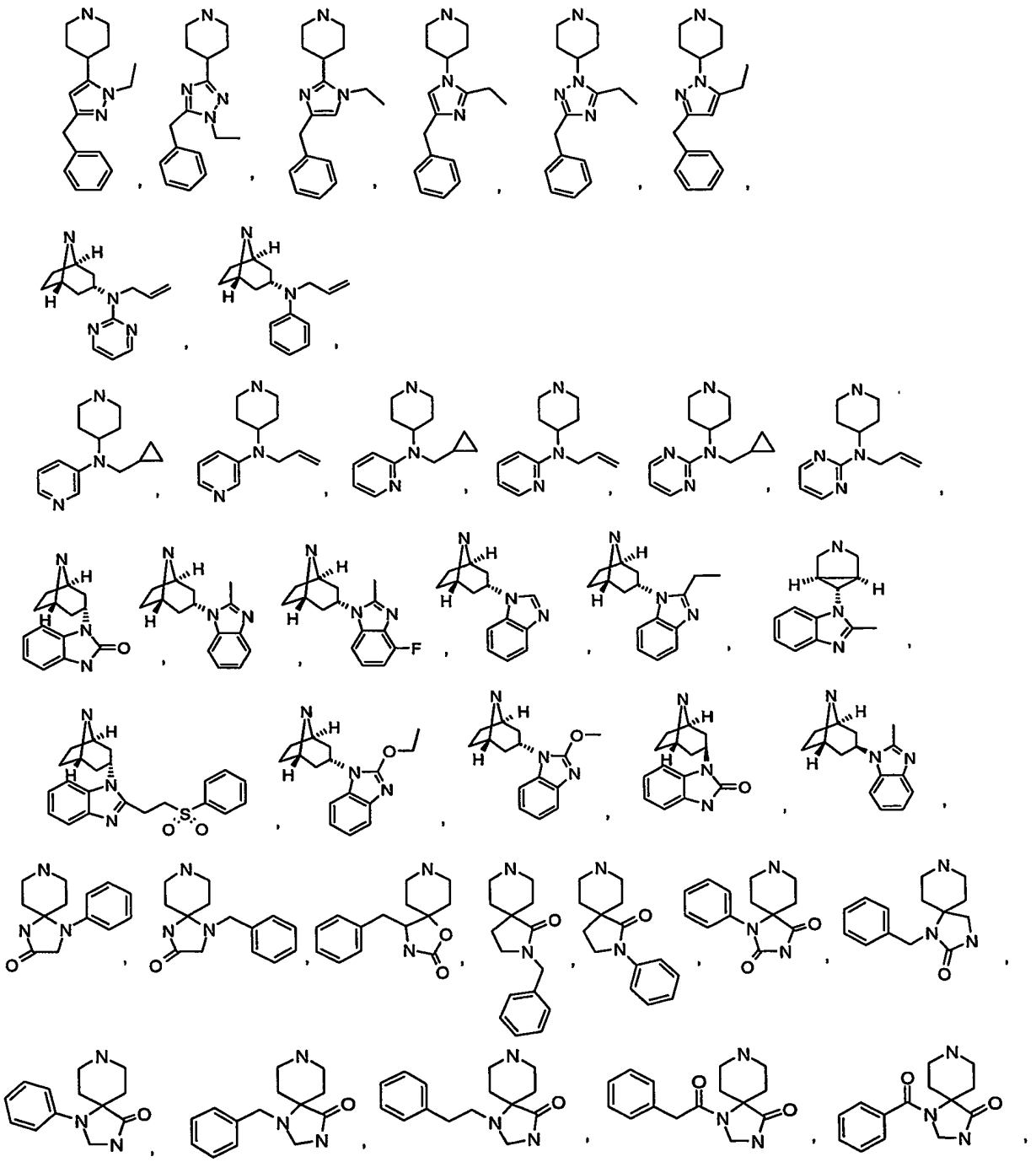
20. The compound of claim 1 wherein the A ring, with two geminal R^2s, is selected from the group consisting of:

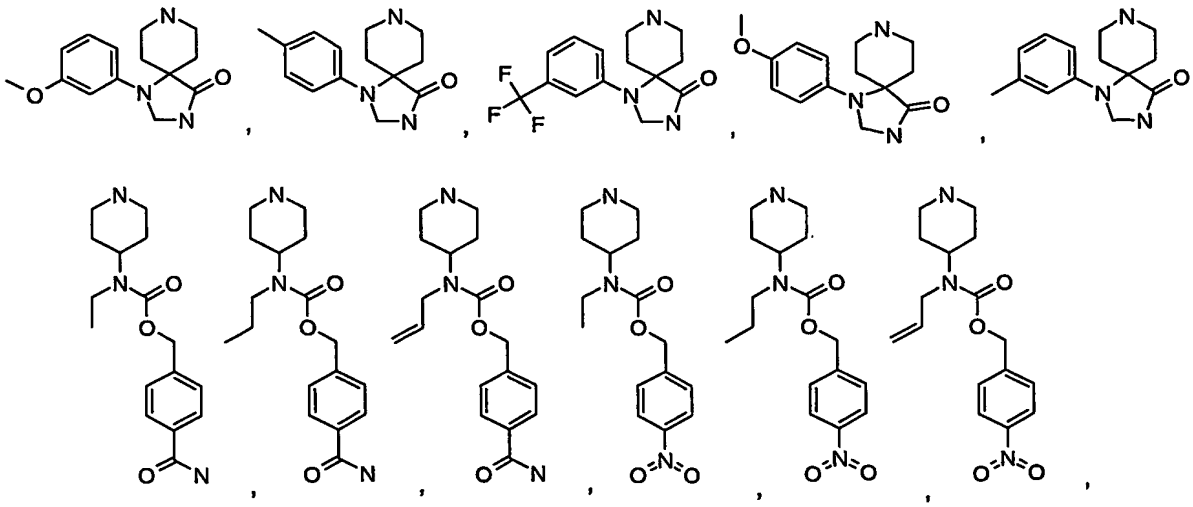


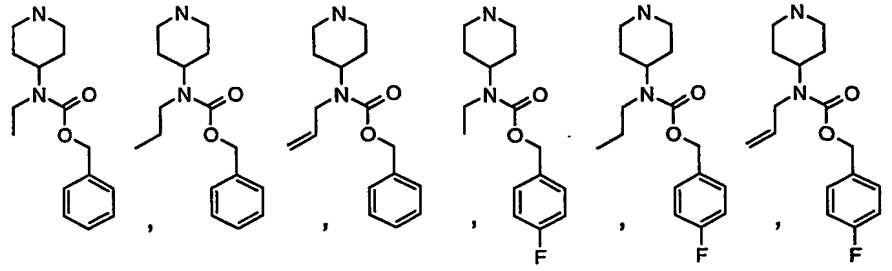
21. The compound of claim 1 wherein the A ring is tropane or piperidine, either optionally substituted with one or more R^2.

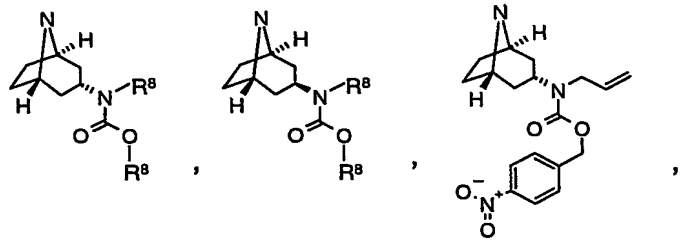
22. The compound of claim 21 wherein the A ring in combination with R^2 is

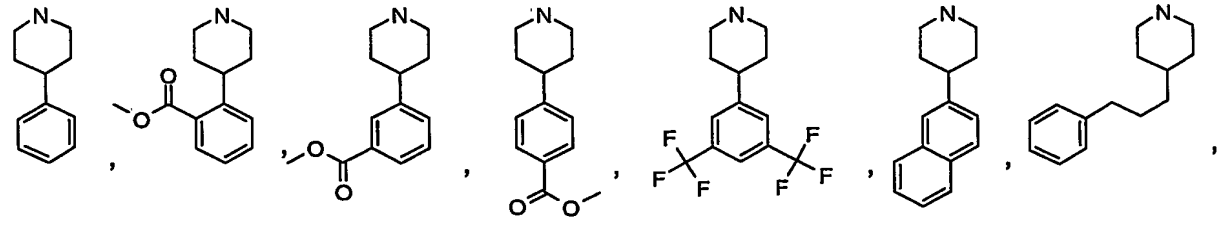


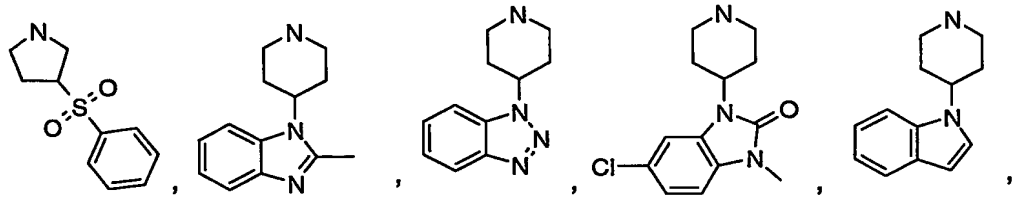


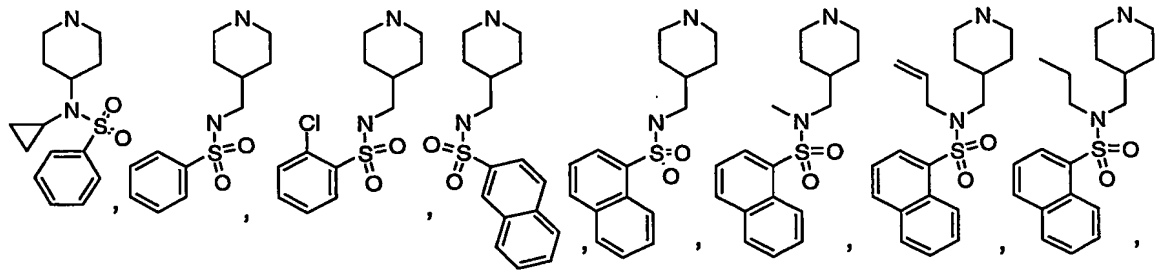


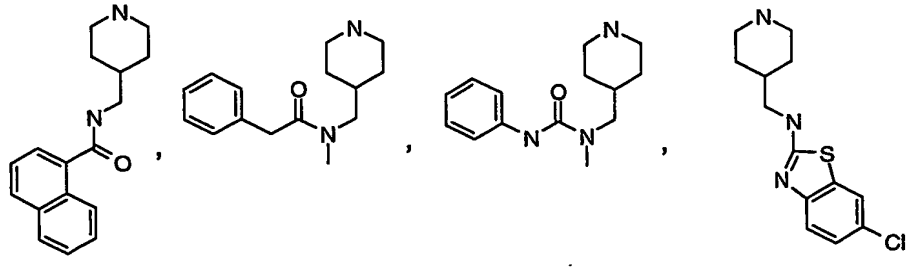


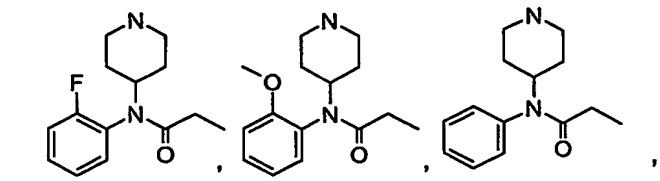
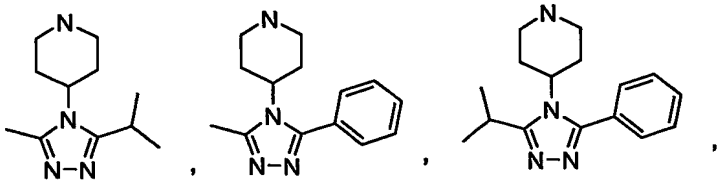
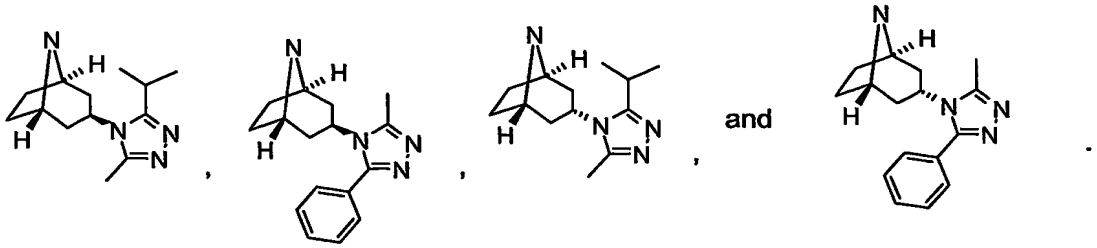








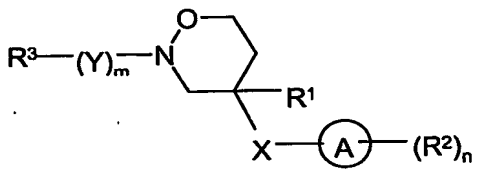


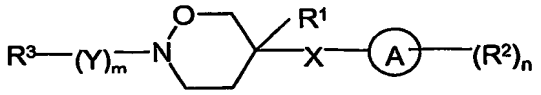




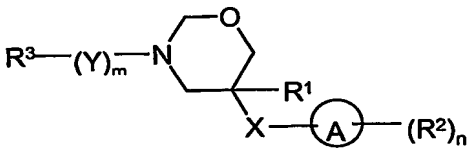
23. The compound of claim 1 wherein the A ring contains at least one additional nitrogen atom and said A ring optionally is N-substituted.

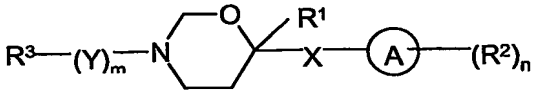
24. The compound of claim 23 wherein the A ring is N-substituted with $-(CH_2)_a-(V_b-R+)$.

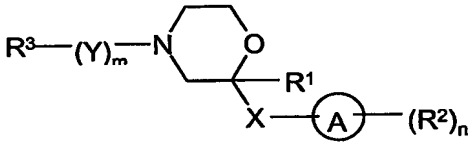
25. The compound of claim 1 wherein ring B is selected from the group consisting of

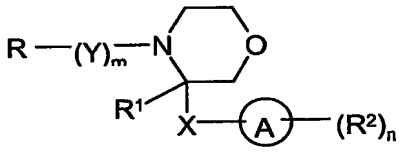

,


,

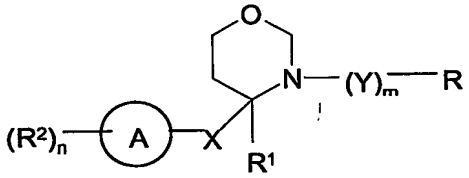

,


,


,


,

and



26. A method of treatment of a viral infection in a mammal comprising administering to said mammal an antiviral effective amount of a compound according to claims 1-24.

27. A method according to claim 26 wherein the viral infection is an HIV infection.

28. A method of treatment of a bacterial infection in a mammal comprising administering to said mammal an effective amount of a compound according to claims 1-24.

29. A method according to claim 28 wherein the bacterium is *Yersinia pestis*.

30. A method of treatment of multiple sclerosis, rheumatoid arthritis, autoimmune diabetes, chronic implant rejection, asthma, rheumatoid arthritis, Crohns Disease, inflammatory bowel disease, chronic inflammatory disease, glomerular disease, nephrotoxic serum nephritis, kidney disease, Alzheimer's Disease , autoimmune encephalomyelitis, arterial thrombosis, allergic rhinitis, arteriosclerosis, Sjogren's syndrome (dermatomyositis), systemic lupus erythematosus, graft rejection, cancers with leukocyte infiltration of the skin or organs, infectious disorders including bubonic and pneumonic plague, human papilloma virus infection, prostate cancer, wound healing, amyotrophic lateral sclerosis and immune mediated disorders in a mammal comprising administering to said mammal a pharmceutically effective amount of a compound according to claims 1-24.

31. A compound according to claims 1-24 for use in medical therapy.

32. Use of a compound according to claims 1-24 in the manufacture of a medicament for the treatment or prophylaxis of a viral infection.

33. The use according to claim 31 wherein the viral infection is a HIV infection.

34. Use of a compound according to claims 1-24 in the manufacture of a medicament for the treatment or prophylaxis of a bacterial infection.

35. The use according to claim 33 wherein the bacterium is *Yersinia pestis*.

36. Use of a compound according to claims 1-24 in the manufacture of a medicament for the treatment or prophylaxis of multiple sclerosis, rheumatoid arthritis, autoimmune diabetes, chronic implant rejection, asthma, rheumatoid arthritis, Crohns Disease, inflammatory bowel disease, chronic inflammatory disease, glomerular disease, nephrotoxic serum nephritis, kidney disease, Alzheimer's Disease , autoimmune encephalomyelitis, arterial thrombosis, allergic rhinitis, arteriosclerosis, Sjogren's syndrome (dermatomyositis),

systemic lupus erythematosus, graft rejection, cancers with leukocyte infiltration of the skin or organs, infectious disorders including bubonic and pneumonic plague, human papilloma virus infection, prostate cancer, wound healing, amyotrophic lateral sclerosis and immune mediated disorders.

37. A pharmaceutical composition comprising a pharmaceutically effective amount of a compound according to claims 1-24 together with a pharmaceutically acceptable carrier.

38. The pharmaceutical composition according to claim 36 in the form of a tablet or capsule.

39. The pharmaceutical composition according to claim 36 in the form of a liquid.

40. A method of treatment or prevention of a viral infection in a mammal comprising administering to said mammal a composition comprising a compound according to claims 1-24 and another therapeutic agent.

41. A method according to claim 40, wherein said composition comprises another therapeutic agent selected from the group consisting of (1-alpha, 2-beta, 3-alpha)-9-[2,3-bis(hydroxymethyl)cyclobutyl]guanine [(-)BHCG, SQ-34514, lobucavir], 9-[(2R,3R,4S)-3,4-bis(hydroxymethyl)-2-oxetanosyl]adenine (oxetanocin-G), acyclic nucleosides, acyclovir, valaciclovir, famciclovir, ganciclovir, penciclovir, acyclic nucleoside phosphonates, (S)-1-(3-hydroxy-2-phosphonyl-methoxypropyl)cytosine (HPMPC), [[[2-(6-amino-9H-purin-9-yl)ethoxy]methyl]phosphinylidene]bis(oxymethylene)-2,2-dimethylpropanoic acid (bis-POM PMEA, adefovir dipivoxil), [[(1R)-2-(6-amino-9H-purin-9-yl)-1-methylethoxy]methyl]phosphonic acid (tenofovir), (R)-[[2-(6-Amino-9H-purin-9-yl)-1-methylethoxy]methyl]phosphonic acid bis-(isopropoxycarbonyloxymethyl)ester (bis-POC-PMPA), ribonucleotide reductase inhibitors, 2-acetylpyridine 5-[(2-chloroanilino)thiocarbonyl) thiocarbonohydrazone and hydroxyurea, nucleoside reverse transcriptase inhibitors, 3'-azido-3'-deoxythymidine (AZT, zidovudine), 2',3'-dideoxycytidine (ddC, zalcitabine), 2',3'-dideoxyadenosine, 2',3'-dideoxyinosine (ddI, didanosine), 2',3'-didehydrothymidine (d4T, stavudine), (-)-beta-D-2,6-

diaminopurine dioxolane (DAPD), 3'-azido-2',3'-dideoxythymidine-5'-H-phosphophonate (phosphonovir), 2'-deoxy-5-iodo-uridine (idoxuridine), (-)-cis-1-(2-hydroxymethyl)-1,3-oxathiolane 5-yl)-cytosine (lamivudine), cis-1-(2-(hydroxymethyl)-1,3-oxathiolan-5-yl)-5-fluorocytosine (FTC), 3'-deoxy-3'-fluorothymidine, 5-chloro-2',3'-dideoxy-3'-fluorouridine, (-)-cis-4-[2-amino-6-(cyclopropylamino)-9H-purin-9-yl]-2-cyclopentene-1-methanol (abacavir), 9-[4-hydroxy-2-(hydroxymethyl)but-1-yl]-guanine (H2G), ABT-606 (2HM-H2G) ribavirin, protease inhibitors, indinavir, ritonavir, nelfinavir, amprenavir, saquinavir, fosamprenavir, (R)-N-tert-butyl-3-[(2S,3S)-2-hydroxy-3-N-[(R)-2-N-(isoquinolin-5-yloxyacetyl)amino-3-methylthiopropanoyl]amino-4-phenylbutanoyl]-5,5- dimethyl-1,3-thiazolidine-4-carboxamide (KNI-272), 4R-(4alpha,5alpha,6beta)]-1,3-bis[(3-aminophenyl)methyl]hexahydro-5,6-dihydroxy-4,7-bis(phenylmethyl)-2H-1,3-diazepin-2-one dimethanesulfonate (mozenavir), 3-[1-[3-[2-(5-trifluoromethylpyridinyl)-sulfonylamino]phenyl]propyl]-4- hydroxy-6alpha-phenethyl-6beta-propyl-5,6-dihydro-2-pyranone (tipranavir), N'-[2(S)-Hydroxy-3(S)-[N-(methoxycarbonyl)-l-tert-leucylamino]-4- phenylbutyl-N alpha-(methoxycarbonyl)-N'-[4-(2-pyridyl)benzyl]-L- tert-leucylhydrazide (BMS-232632), 3-(2(S)-Hydroxy-3(S)-(3-hydroxy-2-methylbenzamido)-4-phenylbutanoyl)-5,5-dimethyl-N-(2-methylbenzyl)thiazolidine-4(R)-carboxamide (AG-1776), N-(2(R)-hydroxy-1(S)-indanyl)-2(R)-phenyl-methyl-4(S)-hydroxy-5-(1-(1-(4-benzo[b]furanylmethyl)-2(S)-N'-(tert-butylcarboxamido)piperazinyl)pentanamide (MK-944A), interferons, α-interferon, renal excretion inhibitors, probenecid, nucleoside transport inhibitors, dipyridamole, pentoxifylline, N-acetylcysteine (NAC), Procysteine, α -trichosanthin, phosphonoformic acid, immunomodulators, interleukin II, thymosin, granulocyte macrophage colony stimulating factors, erythropoetin, soluble CD_4 and genetically engineered derivatives thereof, non-nucleoside reverse transcriptase inhibitors (NNRTIs), nevirapine (BI-RG-587), alpha-((2-acetyl-5-methylphenyl)amino)-2,6-dichloro-benzeneacetamide (loviride), 1-[3-(isopropylamino)-2-pyridyl]-4-[5-(methanesulfonamido)-1H-indol-2-ylcarbonyl]piperazine monomethanesulfonate (delavirdine), (10R, 11S, 12S)-12-hydroxy-6, 6, 10, 11-tetramethyl-4-propyl-11,12-dihydro-2H, 6H, 10H-benzo(1, 2-b:3, 4-b':5, 6-b")tripyran-2-one ((+) calanolide A), (4S)-6-Chloro-4-

[1E)-cyclopropylethenyl)-3,4- dihydro-4-(trifluoromethyl)-2(1H)-quinazolinone (DPC-083), (S)-6-chloro-4-(cyclopropylethynyl)-1,4-dihydro-4-(trifluoromethyl)-2H-3,1-benzoxazin-2-one (efavirenz, DMP 266), 1-(ethoxymethyl)-5-(1-methylethyl)-6-(phenylmethyl)-2,4(1H,3H)-pyrimidinedione (MKC-442), and 5-(3,5-dichlorophenyl)thio-4-isopropyl-1-(4-pyridyl)methyl-1H-imidazol-2-ylmethyl carbamate (capravirine), glycoprotein 120 antagonists, PRO-2000, PRO-542, 1,4-bis[3-[(2, 4-dichlorophenyl)carbonylamino]-2-oxo-5,8-disodiumsulfanyl]naphthalyl-2, 5-dimethoxyphenyl-1, 4-dihydrazone (FP-21399), cytokine antagonists, reticulose (Product-R), 1,1'-azobis-formamide (ADA), 1,11-(1,4-phenylenebis(methylene))bis-1,4,8,11-tetraazacyclotetradecane octahydrochloride (AMD-3100), integrase inhibitors, and fusion inhibitors.

42. A method of treatment of a viral infection in a mammal comprising administering to said mammal a composition comprising a compound according to claims 1-24 and ritonavir.